

## MODULE AGR2100: PROTECTED STRUCTURES

**Level:** Intermediate

**Theme:** Technology and Applications

**Prerequisite:** None

**Module Description:** Students identify essential components of a controlled growing/living environment and demonstrate the techniques used to manage the growing/living environment within a protected enclosure.

**Module Parameters:** Access to a greenhouse structure or livestock/poultry enclosure.

### Curriculum and Assessment Standards

Module Learner Expectations	Assessment Criteria and Conditions	Suggested Emphasis
<p><i>The student will:</i></p> <ul style="list-style-type: none"><li>• identify and explain essential components of controlled growing/living environments</li></ul>	<p><i>Assessment of student achievement should be based on:</i></p> <ul style="list-style-type: none"><li>• identifying six or more environmental components commonly controlled in protected enclosures for crop and/or livestock production, and specific technologies/materials used to control each environmental component.</li></ul> <p><i>Assessment Tool</i> Agriscience and Technology, <i>Chapter 16: Controlled Living Environments</i></p> <p><i>Standard</i> Complete all components of the “Chapter Review” for Chapter 16: <i>Controlled Living Environments</i></p>	10



**MODULE AGR2100: PROTECTED STRUCTURES** (continued)

Module Learner Expectations	Assessment Criteria and Conditions	Suggested Emphasis
<p><i>The student will:</i></p> <ul style="list-style-type: none"> <li>demonstrate basic competencies.</li> </ul>	<p><i>Assessment of student achievement should be based on:</i></p> <ul style="list-style-type: none"> <li>maintaining an anecdotal record of tasks performed in operating a protected enclosure for production purposes.</li> </ul> <p><i>Assessment Tool</i>  <i>Log/Record of Production Tasks, AGRLOG–PLT or AGRLOG–ANM</i></p> <p><i>Standard</i>  <i>Complete all sections of the log/record for tasks performed over a negotiated/contracted period of time</i></p> <ul style="list-style-type: none"> <li>observations of individual effort and interpersonal interaction during the learning process.</li> </ul> <p><i>Assessment Tool</i>  <i>Basic Competencies Reference Guide and any assessment tools noted above</i></p>	<p>Integrated Throughout</p>

Concept	Specific Learner Expectations	Notes
<p>Essential Components</p>	<p><i>The student should:</i></p> <ul style="list-style-type: none"> <li>define and give examples of controlled growing environments</li> <li>describe environmental components that are commonly controlled in protected enclosures; e.g.:               <ul style="list-style-type: none"> <li>temperature</li> <li>humidity</li> <li>light intensity</li> <li>atmosphere</li> </ul> </li> <li>explain how specific problems in agriculture production are solved through environmental control</li> <li>describe control systems and technologies used to maintain temperature, humidity, light and atmospheric gases at specific levels</li> </ul>	<p>Consider “minimum altering” (e.g., fence or cold frame) and “maximum altering” (e.g., greenhouse or totally confined rearing structure).</p> <p>Consider:</p> <ul style="list-style-type: none"> <li>light quality</li> <li>light intensity</li> <li>light exposure time.</li> </ul> <p>Plan for individual/small group research and presentations.</p>

**MODULE AGR2100: PROTECTED STRUCTURES** (continued)

Concept	Specific Learner Expectations	Notes
Essential Components (continued)	<p><i>The student should:</i></p> <ul style="list-style-type: none"> <li>• describe methods of maintaining sanitation and reducing/minimizing contaminants</li> <li>• identify utility/service requirements and energy conservation methods for a controlled growing environment.</li> </ul>	
Agricultural Applications	<ul style="list-style-type: none"> <li>• explain applications of controlled growing environments in crop or livestock production; e.g.:               <ul style="list-style-type: none"> <li>– temperature, light, humidity and atmosphere control systems</li> <li>– feed and watering systems</li> <li>– sanitation and health practices</li> </ul> </li> <li>• prepare a design for environmental control that addresses one or more problems in a crop or livestock production venture; e.g.:               <ul style="list-style-type: none"> <li>– identify production problems caused by environmental factors</li> <li>– design structures and equipment that address production problems through partial or complete control of the growing environment</li> <li>– prepare accurate working drawings and/or models of the production facility</li> </ul> </li> <li>• identify benefits and problems resulting from the use of protected enclosures in crop or livestock production.</li> </ul>	<p>Applications should be specific to one area of production.</p> <p>Keep design briefs simple.</p> <p>Consider the use of simulations in:</p> <ul style="list-style-type: none"> <li>• planning</li> <li>• layout</li> <li>• construction.</li> </ul>

**MODULE AGR2100: PROTECTED STRUCTURES** (continued)

Concept	Specific Learner Expectations	Notes
<p>Management Practices</p>	<p><i>The student should:</i></p> <ul style="list-style-type: none"> <li>• identify safety hazards and demonstrate safe practices while performing production tasks within a protected enclosure</li> <li>• regulate and manage the growing environment for a designated crop or livestock species; e.g.:               <ul style="list-style-type: none"> <li>– operate control systems to maintain temperature, humidity and ventilation at proper levels</li> <li>– operate artificial lighting and shade-control mechanisms to maintain proper light intensity</li> <li>– regulate watering and feeding systems to ensure nutritional requirements are met</li> </ul> </li> <li>• maintain a daily log that details activities regarding production and/or facility management</li> <li>• demonstrate appropriate sanitation and health practices within a protected enclosure; e.g.:               <ul style="list-style-type: none"> <li>– manage/control disease and pests</li> <li>– dispose of waste material</li> </ul> </li> <li>• perform routine maintenance services and repairs to protected enclosures.</li> </ul>	<p>List the necessary steps taken in managing/maintaining a controlled growing environment.</p> <p>Consider:</p> <ul style="list-style-type: none"> <li>• heating</li> <li>• lighting</li> <li>• humidity</li> <li>• ventilation</li> <li>• nutrition/watering systems</li> <li>• sanitation.</li> </ul>

